Shifting the Industrial Food System Towards Sustainability

The Intersections of Agriculture, Industrialization, & Health

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Abstract

This work traces the impact of the industrialization of corporate agriculture that has agglomerated globally. The aim of this paper is to discuss the major impacts and technicalities behind modern agricultural practices, and to draw attention to the intersections between industrialization, technology, health, and environmental concerns. This paper addresses the social and political implications associated with a global trade system and attempts to remedy some of them through environmentally and socially sustainable, and deconstructive, systemic approaches. There are several intersections between social equity, globalization, and agriculture that Urban and Regional Planners can work intimately with to improve overall food security and public health.

Chapter 1 Introduction to Industrial Agriculture

Within the last 100 years, agriculture in the United States has led in a global movement from largely subsistence family farming to corporate, industrial agricultural production. Spearheaded in the United States in part by policies that favored investments in chemical fertilizer, and use of agricultural machinery that was increasingly large and embodied sophisticated technology. This type of farm production required larger, more technical farm holdings to be efficient. The US Department of Agriculture promoted this more emerging "scientific, mechanized and efficient" form of agriculture production. It was a paradigm that yielded great short-term benefits: increased yields, reduced the need for farm labor, and yielded efficient mono-crop production of staples to meet global demand. And it, and the successes of this approach in the US farm system, was embraced around the world. Industrialized agriculture gained a global footing, and was perceived as the "modern" and forward-looking face of agriculture. It was aided in this by the development of the "green revolution technology" of hybridization of crops that were designed for high yield and required high input of chemical fertilizer and reliable and plentiful irrigation for watering at predictable and defined times. To be successful, larger parcels of land were needed to be used for mono-cropping.

Regardless of season or location, the global industrial agricultural system reliably provides all types of food, other crops year-round, in a planned and defined cycle of production. It is an industrialized process not unlike the factory production of manufactured goods. There truly are no more seasonal food items, produced around an annual weather cycle. Food is transported from the far reaches of the global supply chain so that any food stuff can be obtained at any time of the year. Strawberries can be purchased at the typical US grocery store in December and fall and winter squash at the height of summer in July. This bountiful supply, detached from the constraints of the weather cycle, is made possible with the use of modern technology such as industrial scale equipment and tools, driven by fossil-fuels. Petroleum-fueled machines are either refined and designed towards large scale crop production, harvesting, or towards transportation and storage.

Agriculture in the 21st century relies on enormous and expensive machinery, modern science-based technology and inputs, detailed organizational systems, and hierarchical societies

where labor is available at low cost for cultivation that results in mass production of billions of tons of food each year. Development of industrial agricultural technology and the government and corporate systems that promoted it are the leading factors behind how the modern global food production, supply and consumption network came to fruition within the last century. In America, an overwhelming majority of the food produced is under large scale mega-farms, rather than the- previously dominant- small-scale family farm.

With the help of its predecessor- the Industrial Revolution- the Post World War II Era brought about globalization and welcomed in the "Oil Era" and dependence on fossil fuel driven production. The industrial agriculture network controls global trade, with every sub-industry intertwined with each other including: pre-season site preparation, cultivation, harvesting, collection, packaging production, and consumption. Industrial agriculture blossomed under Big Oil because now machines could be powered by fuel rather than by man or animal power. The modern, highly complex, food systems in place are "complicated and deeply intertwined with the petroleum-based fuel economy" (Foodfuelfuture).

The Post World War II era also brought about a new opportunity for capitalism to boom. "During the nineteenth century, capital spread from the Atlantic to the Pacific, and in the twentieth, US capital has penetrated almost every part of the world" (D'Emilio, 1993, p.251). As industrial, corporate agriculture displaced jobs in agriculture with mechanization it resulted in more and more people moving off farms into cities. Industrial, corporate agriculture allowed fewer and fewer people to supply all the food needed by the population. Fewer people grow their own food and depended more and more on grocery outlets and on purchasing food with money in supermarkets and grocery chains.

This modernization and industrial-scale production has stimulated population growth by providing a steady and reliable source of food at an affordable price. It has also encouraged unsustainable resource consumption, unsustainable for both the land and people. Chemical pesticides and fertilizers are utilized to reach the desired outcome of highest yields possible; millions of hectares of land are cleared for livestock grazing; and resources such as soil and water are unsustainably consumed without proper attention to conservation and replenishment.

American food consumption rates are some of the highest around the world, but the bulk of the caloric intake is from highly processed foods that lead to severe health concerns. And while America has extraordinary food consumption rates, millions are still living without access to healthy and accessible food sources.

Hundreds of individuals, groups, communities, and organizations around the country have taken notice of the multitude of harms and inequalities that the industrial agricultural system breeds and are actively working to combat these and the system that perpetuates them. They posit that new approaches and frameworks must be established to combat the current food inequality and environmental destruction. There are ways both at the global and down to the local levels as to how to create more sustainable and equitable food systems. Food cultivation must be environmentally conscious if people are to continue to not only live and grow but to thrive and flourish in a balanced state between the natural and ecological system.

Urban and Regional Planners are essential in the effort to shift industrial agriculture towards sustainable agriculture and food sovereignty. City departments, such as the Community Development Department, work closely with different communities and aim to improve the overall quality of life and health of residents within a city. Planners work with and shape policy that directly affects people and their access to foods; they can be the voice of marginalized communities who are most affected by the negative impacts of "food desserts" and other environmental factors that are detrimental to their health and wellbeing. Often these populations do not have representatives in positions of authority and decision making in the corporate sector or in relevant governmental offices. Planners also have a hand in policy making related to zoning and the shaping of cities. These policies can determine where people live, the conditions and environmental qualities of those locations, and the level of services and amenities available in those locations. These factors also have a direct effect on people's access to food and health resources that support health and wellbeing. Planners are thus in a position to help tackle the negative forces that lead to food injustice and environmental injustice, which often manifest in racially characterized areas, through education and city policy. They are also in a position to educate and inform the community about alternatives that are improvements to their condition, and to steer community change to attain such alternatives.

Chapter 2 Background & Historical Evolution of the Modern Food System

This global network of agricultural production, food systems, and consumption patterns seen around the world today is complex, nuanced, and fine-grained in its variations. Initially and historically human communities depended on a nomadic lifestyle, moving where nature made food gathering and subsistence possible. When human communities established sedentary roots by clearing land, establishing crops and agriculture cultivation, diets consisted mainly of self-grown food. With the few exceptions of trade networks such as the Silk Road and other major trade routes that catered to the consumption of the elites in hierarchically organized societies, nearly all calories consumed were grown within an individual's immediate region. The rapid progression of technology helped curate this boom.

As a consequence of the globally scaled efforts to promote such food production systems, LMICs (low to middle income countries) have become so intertwined with others that their home economies and populations cannot survive (be sustained) independently. Global agribusiness perseveres over all other network models because it is a sturdy and robust network, with little risk of famine or disease. The industrially-sized scale of food production is an unassuming predecessor of the ever-growing consumption rates and technological innovations

History

Food and diet play crucial roles in societal and, the formation of, cultural identity. Historically, people have evolved their identities around food. In a pre-globalized world, this sense of identity was especially apparent and unifying because people lived (and ate) regionally. Realizing the impact food has on people is vital to properly understand the consequences of food system changes and resulting cultural suppression.

Agriculture has evolved to be performed under very specific practices and methods. The global system of today can be traced back to European and other Eurasian roots. Western agriculture is extremely anthropogenic and manipulative in its relationship with the land. Anthropogenic in the sense that it focuses on what the *farmer* can grow, when, and how much by utilizing man made tools and inputs (pesticides, tractors, etc.) all with the underlying goal of maximum production; whereas non-anthropogenic agriculture, say Indigenous food cultivation, focuses on tending to

and caring for the land and animals to try to ensure highest production yield as "naturally" as possible, with use of little to no man-made inputs. The term "anthropogenic" is used to illustrate how plants and soil are genetically modified to ensure the quickest and highest yielding growing seasons.

As a result of colonization, European agriculture, society, and economics, have become global. With the first wave of European colonization and imperialism infiltrating the world during the Age of Discovery (1400-1700s), many European customs and ideals were able to spread (Age of Exploration). European traditions and cultures dominated over their Indigenous counterparts as settlers forced Indigenous peoples to live under their rule or be killed. This proliferation of European life forever shaped modern history and has had global reach, affecting most of the world. Additionally, with the growth and partnership of globalization, industrialization, and capitalism, industrial Western practices have taken precedence over all modes of agricultural affairs. Motorized tools have allowed humans to grow enough food to feed billions of people. But, the current global system of distribution-capitalism- and political differences hinder high levels of access to food for all.

Industrialization

The proliferation of global agriculture and ever-modernizing use of industrial-scale machines are stuck together in a positive feedback loop. Agricultural practices have had to stay up to date with the times in order to feed the ever-growing population. "It has always been on the technological frontier in developing, modifying, or stealing new technologies, such as large-scale mechanical technology, irrigation equipment, plant varieties, pest control, [and] food processing" (Jones, 2016, p.869).

Technological innovations such as the fossil-fueled trucks, plows, and harvesters, have allowed agribusiness to collect enormous crop yields in a fraction of the time in comparison to their animal-operated predecessors. The ability to transport food safely over long distances is what has really allowed for the rapid expansion of the global food network. Global populations then began to start economically funding and supporting global agriculture which then gave global agriculture the ability to invest in bigger and bigger machines, to collect larger harvests and, to then in turn feed the ever-growing population.

Transportation technology, such as cargo ships and freight trains, once powered by coal, and now oil, allow for massive amounts of food to travel thousands of miles within mere days. “The food supply chain relies on a complex web of interconnected infrastructure.” Transportation infrastructure, such as trans-continental railroads and cargo ports, are what have allowed for nearly unprecedented growth in trade (Konar, 2020). The global economic structure of capitalism serves to fuel this rate of growth in trade.

Storage innovations-refrigeration and air sealing- have allowed food to be preserved on long-distance travels. This technology has also crafted long shelf-lives for many packaged foods. Agribusiness sub-industries focus on travel and aim to move food as efficiently and safely as possible. “Food Miles” is a coined term to demonstrate how far food has travelled from farm to table. However, there is still some debate as to when the mileage should begin to be counted and how to exactly calculate food’s carbon footprint, making this concept underutilized and often not a reliable determinant of industrial agriculture’s impact on the environment or on society. Megan Konar, a professor at University of Illinois, has produced a map (Figure 1) that illustrates “food flow between counties in the US. Each line represents the transportation of all food commodities, along transit routes” (Konar, 2020).

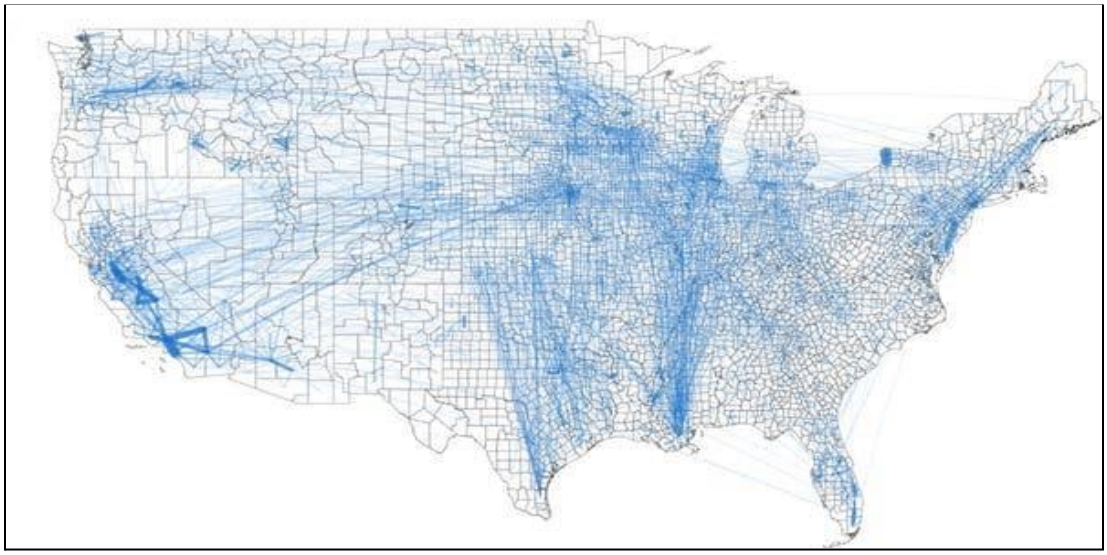

Figure 1: National Food Flow

This map's aim is to illustrate the connectivity between counties, food hubs, and miles traveled. It demonstrates that "consumers all rely on distant producers; agricultural processing plants; food storage like grain silos and grocery stores; and food transportation systems" (Konar, 2020). The current food network is so highly intertwined with so many different regions and populations, accessibility has increased tenfold since the Post-World War II era. Figure 1 demonstrates how many regional hubs trade food in America; much of the map is covered with trade routes implying that many areas are being reached far and wide with industrially produced food. Yet, there are still regions that dot the country that suffer from a high level of food inaccessibility. There are also spots across the country that are moving towards food sovereignty, which indicates that people are growing their own food- only being reliant upon themselves- rather than being forced to depend on global agribusiness.

Chapter 3 Health and Relation to Food

Health, in a general sense, is the state of well-being of a person or object. In terms of environmental health, measurements of air quality, soil quality, water quality, and biodiversity levels can all be addressed to assess an ecosystem, or environment's, overall well-being. When discussing human health, physical makeup, chemical levels, and organ functionality can all be taken into consideration to determine a person's overall well-being. Health is greatly affected by the fuel used to operate either the land or the body; i.e. the gasoline-fueled machines used on the land or the food used to power the body.

This chapter elaborates on agricultural production of crops and animals, the resources used and any resulting contamination, and the health effects modern agribusiness practices have on human and the environmental health.

Crop Production

Food production on the global scale is highly resource-consumptive and has proven to have a significant impact on generations of waste. The purpose of food production is to maximize profits by maximizing crop yield, the delayed consequences or second-hand effects are ignored or purposely not accounted for. Not only does industrial-corporate farming congest ecosystems and natural resources, but through resource removal, more volatile and extreme environments become more subjectable to droughts, plagues, toxic soil, and various other environmental risks. Crop production takes place in every state of the country, yet there are only a handful of crop species being produced. Figure 2 below depicts where certain crop species are grown within the country (Klein, 2014). Notable is the fact that nearly all fertile soil is utilized, a majority of the Western half of the country is mountain and deserts, making crop production infeasible.

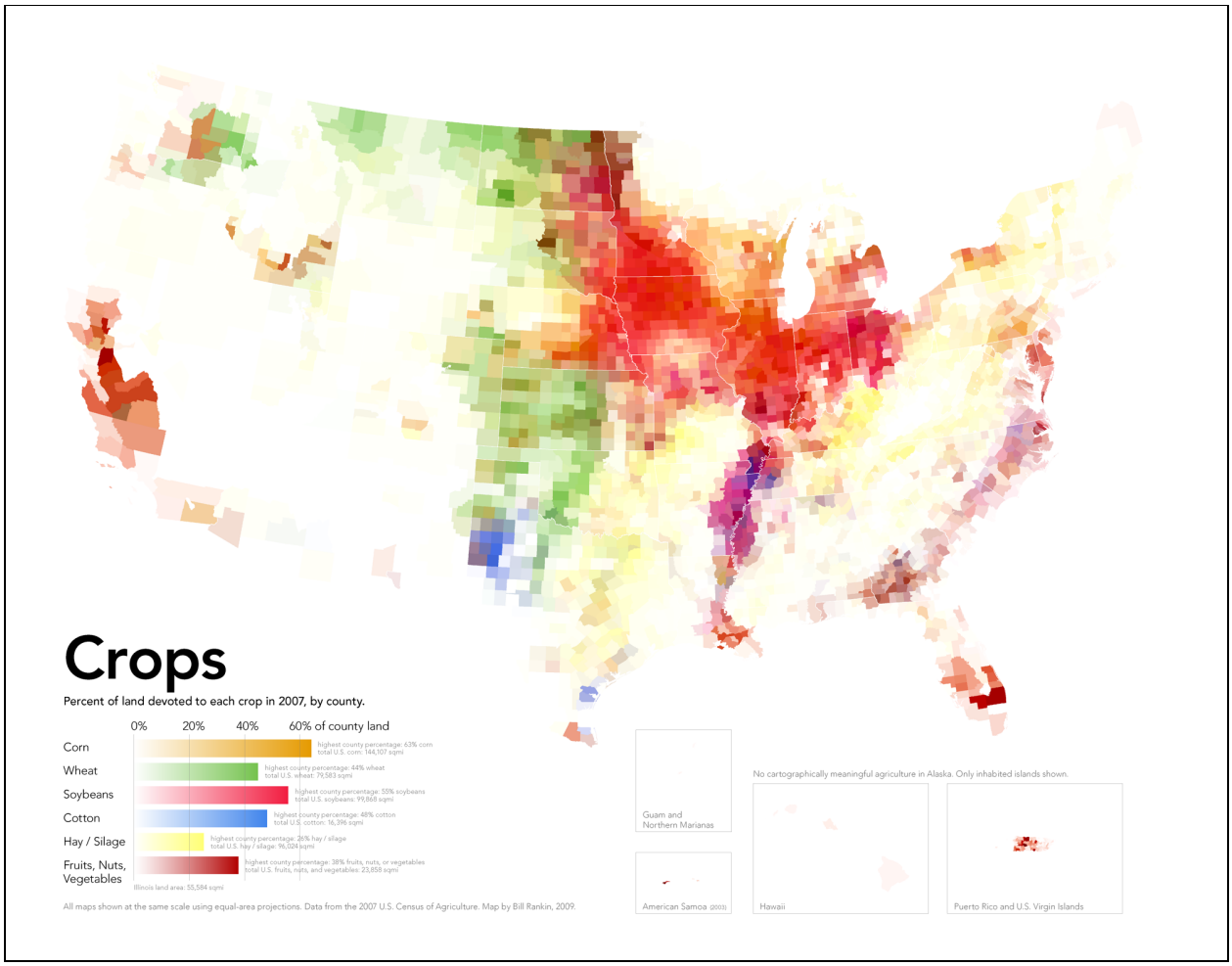

Figure 2: Crop Production in the US

Animal Agriculture

Crops are only half of the picture of the industrial system. Livestock are more resource-consumptive and wasteful than their crop counterparts; Figure 3 below demonstrates where certain livestock species are raised. Again, the effects do not stop merely at land consumption. The waste and emissions these animals produce contributes to environmental damage which then expands outwards from production sites. As shown, a vast majority of the country raises cows, with concentrated chicken and cow production efforts in the South East. (Klein, 2014)

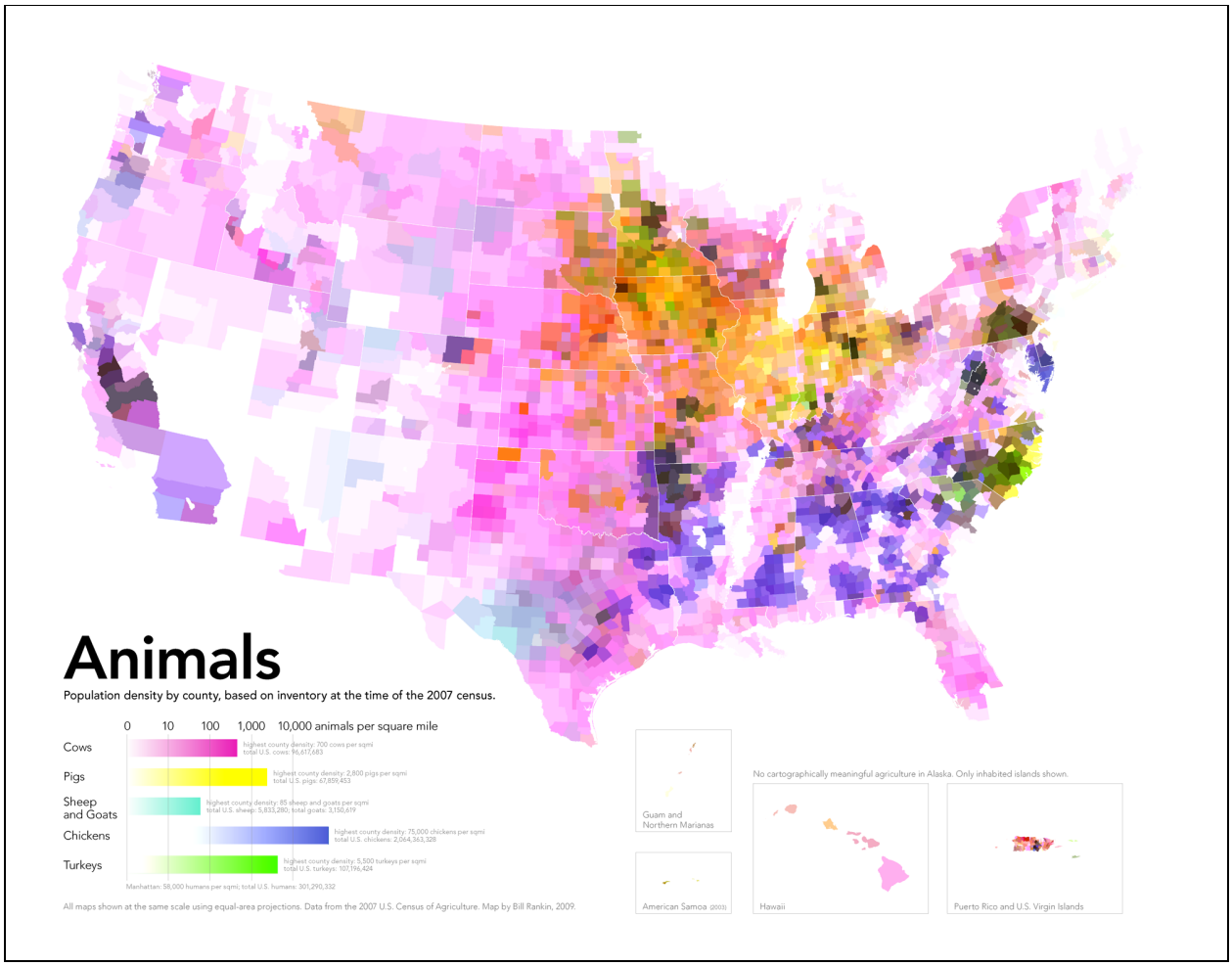

Figure 3: Livestock Production in the US

Americans not only eat large amounts of food, but a typical meal is high in meat, dairy, and sugar (namely processed and refined sugar). Meat is demanding of the environment; raising and processing meat is the highest water (and land) consumption process in industrial agriculture, much more so than growing crops. Deforestation rates can largely be attributed to the increased demand for cattle grazing land. But the effects do not stop merely at land consumption, the waste and emissions these animals produce expands out regionally. Cows are notorious for producing hefty amounts of methane, which contribute immensely to the Greenhouse Gas Effect. An outstanding majority of these animals live on factory-farmed and on Concentrated Animal Feeding Operations (CAFOs). Animal waste seeps into the ground, or nearby water sources and contaminates the entire region. “Algal blooms related to runoff from fertilizers and CAFOs have become more common in recent years in several parts of the United States…” (Rawlinson, 2015, p.32). Water and air become toxic creating a domino effect on the entire ecosystem. The effects

do not stop merely at land consumption. The waste and emissions these animals produce expands out regionally

Agricultural Practices

Mass/industrial food production is beneficial in feeding human populations, but the current methods used in production are unsustainable and come at a deadly cost. Kyle Whyte, Professor of Environment and Sustainability, discusses in Rawlinson's *Global Food, Global Justice*, the intersections of Indigenous food systems, environmental justice, and settler-industrial states; he claims: "Environmental hazards can affect the quality, abundance, and price of food, among other impacts" (Rawlinson, 2015 p.146). Ecosystems are destroyed, burned, and cut down to create room for grazing pastures for livestock and crop rows. This decreases biodiversity and increases negative environmental impacts such as polluted runoff and habitat loss. Other negative effects include "climate change and industrial pollution" which "are both by products of recent changes in the commercial, corporate, capitalist food system" (Mihesuah, 2019, p. 164). Land and resources are unsustainably taken from natural systems, to mass produce food to feed both people and livestock. As mentioned earlier, the anthropogenic European methods and capitalistic economy have little to no regard towards environmental health because their primary focus is on profit maximization.

The global food system uses a variety of chemicals in the form of herbicides, pesticides, and fertilizers to produce bigger crop yields. These chemicals then seep and filter into nearby water sources and the surrounding air. These chemicals have negative and long-lasting health effects on all resources: land, water, air, soil, as well as on people. These chemicals are extraordinarily beneficial for their purpose and work incredibly well for maximizing crop yields and profits while accomplishing their goal of feeding hundreds of millions, if not billions, of people. Yet, when distributed haphazardly, as they often are, the chemicals infiltrate ecosystems and morph resources into toxic, dangerous, or inoperative.

Diet & Health Implications

Industrial food production is not one-sided, consumption habits also create a positive feedback loop with production; the more food produced, the larger the population can grow, the more a

population needs food to sustain its numbers, ergo more food is produced, which allows fort the continued population growth.

America is notorious for its diet: portion sizes are exceptionally large and disproportionately heavy in meat and dairy with a selective few vegetables consumed on the side. As shown in Figure 4, Americans have some of the highest meat consumption rates in the world (Klein, 2014). The vast over-consumption of meat has led to great environmental degradation and severe increases in pollution.

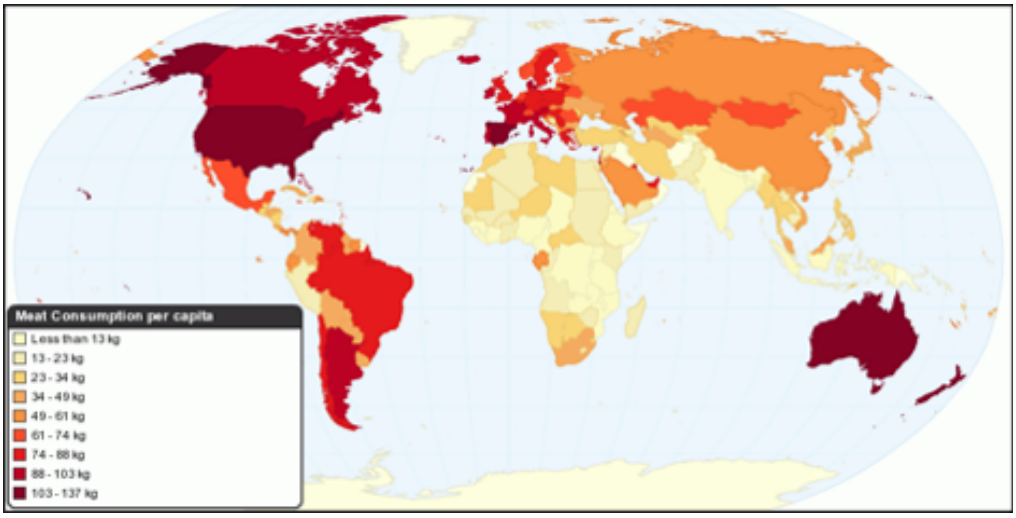

Figure 4: Meat Consumption per Capita

The national government also holds a role in excess consumption of food. National programs, such as dairy subsidizations and the “Food Pyramid" have all contributed to the shaping of the typical American diet. Many people consume traditional dairy products because it is what they grew up on and it is still one of the cheapest options at the store. Dairy is relatively inexpensive- especially when compared to plant-based “dairy” products- because the federal government has been subsidizing dairy farmers and dairy production for decades. If those subsidies were to end or transfer to another industry, many people would shift their diets (either cut out dairy or drastically decrease intake) simply due to economic restrictions. But, with the subsidies in place, Americans are subtly encouraged to consume excessive amounts of milk and cheese. Another tool the US government has used for decades is the “Food Pyramid.” The Food Pyramid is a health standard tool that is targeted towards children. It implies that these are the proportion sizes and amounts of foods one *should* be consuming.

Overconsumption inevitably leads to health concerns and disparities. America has some of the highest levels of obesity and heart disease. Figure 5 shows the nearly unprecedented growth rate of obesity within the last 30 years (Klein, 2014). This figure visibly demonstrates where people are not accessing or eating healthy foods. Most of the foods eaten in these regions are most likely poor in nutrition, cheap and packaged

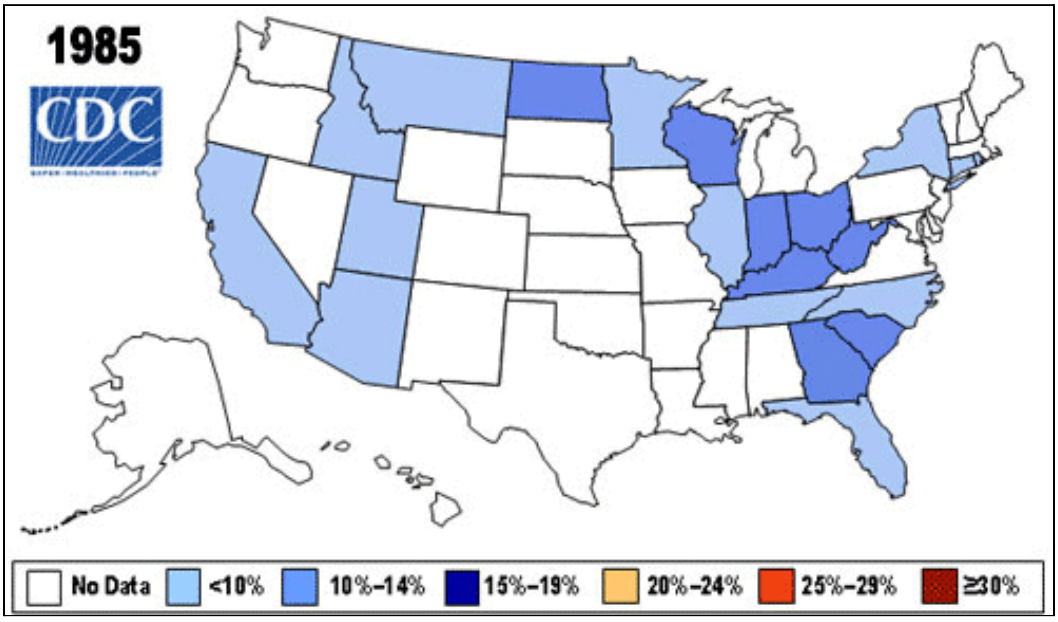

Figure 5: American Obesity Rates (Animated Gif)

Incomplete or unbalanced diets affect not only an individual's health but the broader community too. "Health" is a quasi-umbrella term in that it also refers to well-being or strength, and it can pertain to an individual's health, to their family's health, to the community's health, and so on. Physical, mental, and community health are subject to a multitude of external factors such as one's physical environment, political state, stress levels, financial situation, and so on, all of which are connected to food production and consumption.

Agribusiness: Grocery Stores & Food Deserts

Globalization and capitalistic dominance have allowed for food sources such as grocery stores and fast-food restaurants to have a wide range of foods available for relatively affordable prices, while the industrial technology associated with such, allows for long-term storage and preservation. Compared to the pre-Industrialization era, larger populations now have wider

options in food choice and a higher level of food intake: “The increased availability of low-cost and shelf-stable processed foods has had some benefits. In the last 30 years, there has been a marked decrease in hunger rates in many countries of the Global South” (Rawlinson, 2015, p. 75). Negating price and nutritional value, the global food network is so incredibly expansive and robust, it reaches the broadest amount of people ever seen in human history.

While production and globalization have supplied food and nutrients to people around the world, the economic and business side of the operations have solidified many obstacles that hinder access to healthy foods. Typically, the cheapest foods are frozen and packaged, while the most expensive ones are fresh produce and vegetables, namely the “exotic” fruits and vegetables. Under capitalism, grocer companies contribute to the social inequality and unequal distribution of food, even while, simultaneously, supplying some of the most affordable and long-lasting options. Even though large grocery chains are widespread, many of the healthier, nutrient-rich, and fresh foods within these stores are expensive and/or have a short shelf life. A rampant issue in America, with regards to food accessibility, are food deserts. Figure 6 below depicts regions of the United States and their ratio of food desert communities (Klein, 2014). Affluent communities across the country have multiple food outlets within their town that range in products and price. Many people in food desert communities cannot afford car expenses, which prevents them from driving to a town where fresh produce is sold. If they do have access to transportation, they oftentimes cannot afford the time or energy spent to make these trips nor can they economically afford the fresher produce they travelled the longer distance to obtain. Large grocery companies avoid certain regions if they feel they cannot maximize capital, because as stated, under a capitalistic economy, the main goal is to maximize profits. The global industrial agricultural economy maximizes profits by targeting higher-income regions. There are no laws or regulations in place that force food outlets to be present in a community.

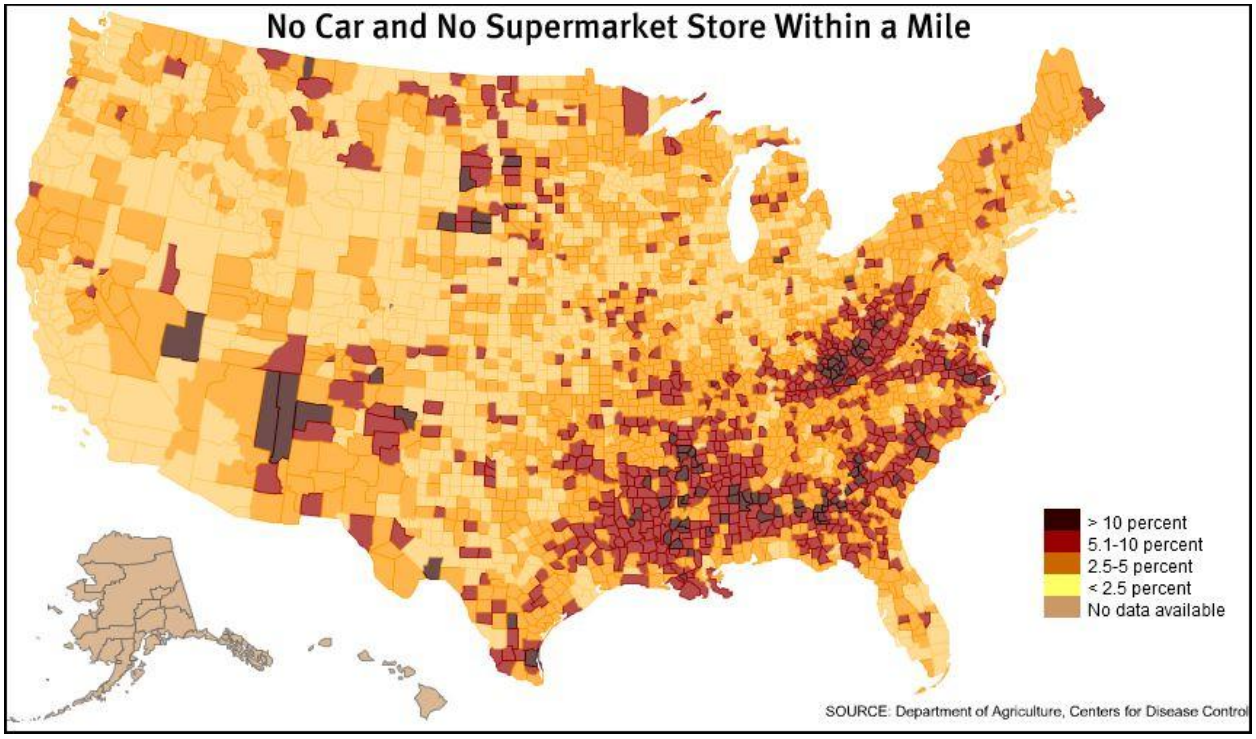

Figure 6: Food Deserts, United States

Chapter 4 Sustainable Alternatives to Industrial Practices

While highly profitable and extensively encompassing, the continuation of the current methods and practices of industrial agriculture cannot be sustained forever, or even for much longer. New practices must be installed, green technology must become widely utilized, and more support must be garnered from power-holding parties if food production is to keep up with the needs of the modern population.

Sustainable Practices

If systems and networks are to remain at the global level, sustainable tools and practices must be adopted and implemented. Green technology and naturally based fertilizers and pesticides are just a few examples of how the global industry can shift towards sustainability. Water conservation, clean air, and soil preservation must be at the forefront when discussing agricultural practices. Without such critical discussions, a sustainable food network will most likely never come to fruition. Pesticides, herbicides, and fertilizers must contain safe, yet still effective, chemicals and ingredients that do not negatively alter pH levels in the water, air, and soil, nor have chemicals that negatively impact the produce being grown or the consumers.

Scale Shift

If industrial-scale operations are unfeasible or not as environmentally restorative and protective as needed, operations can move to the local and regional scales to limit carbon emissions and environmental impact. The benefits of growing food and being self-sufficient go beyond the mere accessibility benefits found in the industrial food network. Growing food establishes a relationship and a self-identity between the individual and their food. When that work is completely removed- and taken to the industrial scale- all of that connection is lost, leaving people to feel hollow and disconnected from their food. The potential social benefits of self-production include, but are not limited to, increased access to food, positive health impacts, skill building, community development, and connections to efforts to bring about broader social change.

Feasible practices on the local or regional scale include (but again, are not limited to): urban farms, community gardens, community-ran food pantries, and farmer's markets. Many of these

methods encompass a varied network of nonprofits, social enterprises, cooperatives, and individuals, operating in all parts of the food system. These include everything from finding and cultivating the land, growing, harvesting, and processing, to consumption and disposal. Individuals and their communities can gain power and control by taking collective ownership of land, creating safe, shared growing spaces, developing shared facilities for processing and businesses and so on. Transformation will likely require reforming neoliberalized policies and institutions, while at the same time building non capitalist practices. A network approach to building and scaling up seems promising, but sustained financing and maintenance must also be taken into account. Government support must be gained in order to carry out any of these actions.

Government Support

One of the biggest ways to bring about change to further equitizing access to quality food is through legislative power: enacting bills and acts that promote traditional, locally grown, affordable food. Community engagement, grassroots organizations, and community-based political groups are crucial in this fight. A main goal for these groups is tackling the organizations and institutions that "control" food production and distribution. A notable idea of the food sovereignty framework is that individuals (or their communities) have total autonomy over food growing, production, collection, and distribution. This may seem nearly unfathomable given the current structure, yet millions around the country are already moving in this direction or have been self-reliant for generations. This is where political support and action are applied; these small-scale food sites need approval from the City through legislative action and planning approval. Cities can go one step further by providing maintenance funding for these food sites. Some municipalities go beyond allowing and incentivizing urban agriculture. They provide funding, staff support, and land for urban agriculture: "Seattle, for example, coordinates and provides some staff support for almost 90 permanently protected community gardens on a variety of public land (owned by one of the city's departments or other public actors, such as Seattle Public Utilities) and private land often church owned" (Horst, 2017, p. 285).

Chapter 5 Planner's Role in Shifting Towards Sustainability

Urban and Regional Planners have great power, and therefore great responsibility, to create healthy communities and sustainable consumption habits related to food and the environment. Socioeconomically disadvantaged communities, that suffer greatly from malnutrition and environmental injustice, often do not have the capacity nor the resources to enact change on their own. Planners can work with groups and municipalities to increase food accessibility and communalize land use policy. Within the legal and political spheres, planners can write policies that support and protect farmworkers and agricultural resources. Increased awareness and education regarding industrial agricultural practices and environmental degradation can also contribute towards the shift towards sustainability.

City Plans and Environmental Justice

The global food network has made farmworkers economically dependent on the work it provides, while simultaneously providing little to no protections for said workers.

The disproportionate negative health effects underrepresented communities of color suffer from manifests through, and is understood by, the concept of environmental racism and injustice. Kyle Whyte defines the term environmental injustice in his chapter in *Global Food, Global Justice*: "Environmental injustice is experienced as environmental hazards that disrupt [Indigenous] food systems, encouraging dependency on settler-industrial foods to which adaptation is difficult without incurring harms" (Rawlinson, 2015, p. 149).

City investments in local agriculture can be targeted to benefit historically disadvantaged communities. Supportive city goals, policies, programs, and strategies can be adopted in the city's general and comprehensive plans. Zoning ordinances and building codes can be amended to legally allow food production.

Communal Land Use Policy & Accessibility

The privatization of land and strict zoning ordinances prevents people from establishing their own food sites independently. In the last decades of the 20th century planners by and large established restrictive zoning that inhibited urban agriculture. Many municipalities outlawed

keeping chickens, bees, goats, and other livestock in residential zones and established strict regulations regarding the height and maintenance of vegetation, effectively making most food production practices illegal (Horst, 2017, p. 285). One may be able to establish a garden or food site with the help of a municipality or permit, but there is no guarantee that a request may be granted. Increasing the amount of land permanently available to local food efforts both increases food access and confronts the threats of gentrification and displacement.

Engaging the community by involving people in the process and adapting their suggested solutions is one key way to create more sustainable, sovereign communities that are not forced to rely on corporate agribusiness. Planners must look at the dedication to food growing in terms of land and resource consumption and must find a balance between all people that need and claim these resources.

Farmworker Support & Protection

One of the largest demographic groups suffering from inaccessibility and unaffordability of food are the very people who grow and process the food. “Few consumers connect the cheap prices they pay for various foodstuffs with the fact that laborers at various stages of food production are paid very low wages” (Rawlinson, 2015, p.38). These various stages are from growers, to pickers, and to food processors, all are being exploited. “Overwhelmingly, these ‘fence line communities’ are communities of color (Rawlinson, 2015, p.136) who are oppressed in other sectors of services and amenities, and hold little political power.

The exploitation of farmworkers is how the capitalistic food system has kept people suppressed and dependent on the system. Nearly 75% of all farmworkers in America are immigrants-often undocumented- low-income, and do not speak English as their first language (Economic Research). All of these social barriers and implications have allowed for extreme worker violations. Patricia Boling, again writes in Chapter Two from Global Food Global Justice, that: “Many [farm workers] are forced to work for less than the minimum wage because they are undocumented immigrants and subject to deportation” (2015, p.33). This leads to injustices including “…the exploitation of farm laborers, who are typically hired as casual day laborers and often work in horrible conditions” (Rawlinson, 2015, p. 33). Not only are these workers

economically exploited but their health and well-being are knowingly put at risk every day: "Such laborers are regularly exposed to pesticides, work in hot fields all day long with few breaks, and have little or no access to water or toilets, while being paid low wages with no benefits" (Rawlinson, 2015, p.34). Planners advocating for more sustainable practices can help reduce negative health implications farmworkers face from working with toxic pesticides.

Planners can also help improve farmworker conditions outside of the field; they can advocate for higher density residential zones that would allow for farmworker housing and temporary lodging. This can be done through zoning ordinances and amendments within city plans.

Agricultural Education

Creating highly accessible educational programs catered towards different demographics contributes to healthy community movements. Planners increasingly recognize the potential for urban and local agriculture to help reach many city goals, such as sustainability, accessibility, livability, food justice, and improving quality of life.

One such educational program that encourages a healthier, more nutritional diet, and helps foster healthy communities, is the MyPlate diagram from the US Department of Agriculture, shown in Figure 7. MyPlate is the new diagram the USDA is using to replace the out-of-date, hierarchical Food Pyramid. MyPlate erases the implication of food hierarchies and replaces it with a balanced view of the major food groups. While it seems insignificant, having the MyPlate diagram in schools and doctor's offices (where the Food Pyramid is typically found) can unobtrusively influence children's minds and help them to make healthier decisions.

Figure 7: USDA MyPlate

Schools are a highly targeted area for disseminating education about food. Many lower education schools (elementary and middle schools) have programs in place that teach students plant and nutrition knowledge. These programs can take the form of garden plots, compost piles, culinary classes, guest speakers, and lunch programs.

Urban and Regional Planners have always been urged to think of creative and nuanced approaches when concerned with age-old urban complications. Updating plans, amending ordinances, protecting workers, and educating the public have all occurred countless times across human history, yet just as concerns, issues, and inequities adapt and evolve, so too, do the approaches and solutions applied, need to become. The complexities and intersections between food access, health, and environmental justice are not new, but the repercussions originating from them are constantly reforming. People can focus on the same goals- equality and accessibility for all- but must try new things if desired results are to ever be obtained.

Chapter 6 Closing Thoughts & Reflection

There is no doubt that the scale and efficiency of industrial agriculture is a testament to human's technological advancements, but, similar to nearly all things known, there are both pros and cons to the success of this globally-scaled agriculture. At this point, the cons outweigh the pros in terms of implications for long-term health and posterity of people and the environment. The negative externalities of the industrial food network related to health keep individuals and communities suppressed and reliant on unhealthy, calorie-dense foods through economic and accessibility factors; fresh foods are expensive and are hard to acquire and afford in food desert communities. The global food system hinders long-term posterity as it embodies exponential deterioration of environmental and physical health. If agricultural practices and crop yields continue at the current rate, there will be very little biodiversity and natural land and resources left within the coming decades. Open space, wildlife, and natural resources will all continue to decline and eventually may disappear completely if industrial agricultural practices continue operating and extracting product from massive swaths of land.

Sustainable agricultural practices are not only necessary to continue to feed populations, but they are the bare minimum for long term survival. *Regenerative* methods and practices need to be at the forefront of sustainability efforts. Regenerative methods need to be given the same time, consideration, and funding as petroleum-powered industrial methods did in previous periods of agricultural historical evolution. Regenerative methods go beyond sustainability approaches; their goal is to actually revive an environment or resource so much so that it can sustain itself without human help. Whereas, sustainable practices merely keep the land or resources from withering away and depleting.

Urban and Regional Planners can, and have, play a crucial role in food security and environmental protection. There are numerous intersections where food justice and planning meet both physically and politically. Planners can physically promote healthy communities through land use zoning and access to public transportation. Planners can politically support food justice by endorsing legislation and building codes that promote urban and local agriculture.

At the end of the day, people and societal long-term health and wellbeing, as well as that of the environment, should take precedence over immediate and short-term production and profit. Protecting, supporting, and funding farmworkers and local agricultural efforts whilst moving towards sustainable and regenerative urban and regional agriculture is how global society can shed current dependence on industrial corporate agribusiness. This shift can sustain and satiate the both the global community and the global environment, in the long-term.

Glossary

Agribusiness

Agribusiness is the; commodification of growing, transporting, and storing food; of agriculture and consumption; and of access and affordability. The economic focus of the global trade of crops and livestock. The global blanketing of capitalism allows for the existence of grocery stores, and other food retailers.

Communities of Color

This term is used to refer to non-white, non-European communities. These groups are oftentimes, but not limited to: black, indigenous, brown, latinx, asian, and pacific islander communities. The term "BIPOC" is often used in these spaces: "Black and Indigenous People of Color." These communities are often targets or recipients of race-based violence and negligence, are typically lower-income, have more people living in poverty, and are underrepresented in local, state, and national government. Often face repercussions of environmental racism and health disparities.

Capitalism

Capitalism is currently the overarching economic system found around the world. It is composed of two parties: means of production and the modes of production. Under this system, one has to sell their labor in order to purchase goods. This is system is starkly different from previous socioeconomic systems in that people are no longer selling goods, they are selling labor.

Environmental Justice

Environmental Justice is a term that was coined in the 1970s. It was used to explain the impact the environment takes from resource extraction and human activity for commerce and consumerism. It advocates for environmental protection by targeting the destruction of industrial pollution and systemic inequities. Environmental Justice with regards to agriculture pertains to water, air, and soil health. The (EPA) defines it as "the fair treatment and meaningful involvement of all people regardless of race, color, national

origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies."

Environmental Racism

Environmental Racism deals with and explains the disproportionate negative effects certain groups of people face due to contamination of their surrounding environment. Due to inadequate historical city zoning ordinances and city policies, (several) communities of color have been forced to live within certain neighborhoods or districts. And, oftentimes, these districts also include, or are adjacent to, heavily polluting land uses such as industrial factories. Not only does the environment suffer adverse effects from industrial production, but the surrounding people have higher possibilities of contracting severe health complexities due to contaminated environment.

Food Network

A food network is the distribution of food items. Food networks can be communal, local, regional, statewide, national, or global. Food networks can be partially protected by government legislation or trade deals, or may be privatized by corporations. Larger scale networks (state, national, international) can be economically impacted by taxes and embargos.

Food Sovereignty

Food Sovereignty is the idea that people are able to support and feed themselves and their own local community without relying on external sources. It is commonly understood as: "By supporting more environmentally sustainable production and greater reliance on smaller producers, food sovereignty also seeks to address the "triple crisis:" displaced local food production for almost 50% of humanity, deepening fossil fuel dependency in an age of peak oil, and industrial agriculture that generates roughly a quarter of the GHG emissions which are contributing to global climate change" (Mihesuah, 2019, p. 9).

Food System

A food system describes how an item was produced, processed, and transported; it is the life of a crop (or farm animal). It does not pertain to the destination of where it was grown or where it is going. (source)

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